

REMARKS/ARGUMENTS

Claims 36-89 remain pending in this Application. Claims 36-47, 50-60, 87 and 88, claims 48, 49, 61 and 62 were objected to as depending from rejected claims. Each of the rejections to the claims are addressed in turn below. The present invention is submitted together with a Request for Continuing Examination, a Supplemental Information Disclosure Statement and a Petition to Make Special. Applicants respectfully request reconsideration of the claims in light of the amendments and the present arguments.

Statement of Joint Inventorship

Applicants were advised in the Office Action of the obligation under 37 C.F.R. 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a). Applicants hereby state that the assignment rights for each inventor were commonly owned by the assignee at the time of each invention as claimed pursuant to 37 C.F.R. § 1.56.

Claim Rejections – Claims 36-43, 50-53 and 55 are rejected under 35 U.S.C. § 103(a).

The Action states that 36-43, 50-53 and 55 are rejected under 35 U.S.C. § 103(a) as being anticipated by Larson III (U.S. 5,229,933) and Antich (U.S. 5,197,475). Applicants respectfully submit that the claims as amended overcome the prior art. Larson is said to teach an array 408 that “would be capable of focus such that the stated +/- 45 is expandable and would be capable of acoustic velocity measurement if connected to suitable focusing and measurement apparatus...” Larson is combined in the Action with Antich (while not combined, taught, suggested or motivated by the art itself), the later teaching basic ultra-critical reflectometry (UCR).

The rejection fails, however, because “would be capable” and “if connected” are not in compliance with the legal standard for a rejection based on obviousness (Action, Page 3). When relying on numerous references or a modification of prior art, “*it is incumbent upon the examiner to identify* some suggestion to combine references or make the modification.” *In re Mayne*, 41 USPQ 2d 1451, 1453-54 (Fed. Cir. 1997)(emphasis added), because “[c]ombining prior art references without *evidence* of such a suggestion, teaching, or motivation simply takes the inventor’s disclosure as a blueprint for piecing together the prior art to defeat patentability –

the essence of hindsight.” *In re Dembiczak*, 50 USPQ2d, 1614, 1617 (Fed. Cir. 1999). The Action provides no citation to the text of the references to argue for the combination because no such teaching, suggestion or motivation is found in the art cited.

Larson teaches a two-dimensional transceiver grid, but, it fails to teach, suggest or motivate any combination with Antich, UCR or the simultaneous measurement of trabecular and cortical bone. Larson merely teaches what was known in the art, namely, a two-dimensional transceiver array, which may be steered using phasing. In fact, two-dimensional transceiver arrays were well-known at the time that Larson was filed and the point of novelty provided by Larson was the use of delays between groups of transceivers within the array. Unlike Larson, the present invention does not require steering of the beam, as the array design of the present invention creates a single cylindrical wave. Also, nothing in the Larson reference teaches its combination with critical reflectometry calculations for trabecular and cortical bone. Larson provides no such teaching because beam steering with the matrix could not detect the critical angle as it would fail to capture the normal and other critical angles required for the measurement of trabecular and cortical bone. Therefore, even if Larson could be combined with Antich (which it cannot), the array used by Larson could not be used to achieve the present invention.

Applicants, therefore, submit that the rejection of claims 36-43, 50-53 and 55 under 35 U.S.C. § 103(a) by a combination of Larson and Antich should be withdrawn.

Claim Rejections – Claims 44-45 and 56-57 are rejected under 35 U.S.C. § 103 (a).

Claims 44-45 and 56-57 stand rejected under 35 U.S.C. § 103(a) as obvious over Larson in view of Antich and Law (5,762,066), adding “containment and window materials” to the rejection. Applicants respectfully submit that the claims as amended overcome the prior art and incorporate the arguments made against the combination of Larson and Antich herein by reference. Again, nothing in Larson, Antich or Law suggest or motivate the present invention, unless the present invention is used as a template or blueprint to achieve the present invention. Furthermore, the Action states that it would have been obvious to add a latex membrane and a water couplant based on Law. However, Law is directed to the heating and ablation of soft tissues (Col 2, ll. 25-27, listing: prostate, cancer and liver; and Col. 5, ll. 37, kidney), not the detection of bone. Applicants, therefore, submit that the rejection of claims 44-45 and 56-57 under 35 U.S.C. §

103(a) over Larson in view of Law, respectively, should be withdrawn.

Claim Rejections – Claims 46, 58 and 60 are rejected under 35 U.S.C. § 103(a).

The Action rejects claims 46, 58 and 60 under 35 U.S.C. § 103(a) as being anticipated by Larson III, Antich in further view of Barthe (6,036,646) to further include a computer control mechanism. Applicants respectfully submit that the claims as amended overcome the prior art and incorporate the arguments made against the combination of Larson and Antich herein by reference. Barthe could be no further from the present invention, namely, the use of rotation of the transceiver to image a three-dimensional target. Barthe images the target in three-dimensions by using the rotation of the arrays to obtain the echo of the soft tissue. Furthermore, the transceiver has to be moved in order to obtain the image. Applicants, therefore, submit that the rejection of claims 46, 58 and 60 under 35 U.S.C. § 103(a) over Larson in view of Barthe, respectively, should be withdrawn.

Claim Rejections – Claims 47 and 59 are rejected under 35 U.S.C. § 103(a).

The Action rejects claims 47 and 59 under 35 U.S.C. § 103(a) as being anticipated by Larson III, Antich in further view of Ohtomo (5,895,357) to further include a housing pressure sensor. Applicants respectfully submit that the claims as amended overcome the prior art and incorporate the arguments made against the combination of Larson and Antich herein by reference. Ohtomo is directed to classical broadband absorptiometry/speed of sound measurements. Briefly, the Ohtomo beam is controlled in amplitude, phase and shape by the ultrasound transducer, which are coupled to the skin and transmit the ultrasound signal through the bone. In other words, Ohtomo uses well-known ultrasound waves to detect the bone shape, and needs to use transceivers facing each other to obtain bone measurements. The present invention has no such requirements. Applicants, therefore, submit that the rejection of claims 47 and 59 under 35 U.S.C. § 103(a) over Larson in view of Ohtomo, respectively, should be withdrawn.

Art cited in the Supplemental Information Disclosure Statement

Concurrently herewith, the Applicants are filing a Supplemental Information Disclosure Statement as part of their continuing duty of candor. In order to advance prosecution, Applicants wish to point out certain key distinctions between the newly found art and the present invention. First, the present invention is used to concurrently detect all the bone signals necessary to obtain

the trabecular and cortical bone measurement without the need to move the array. While additional measurement may be taken, they are not required. Second, the prior art uses a focal point outside the body of the patient, while the present invention creates a “virtual” focal point within the bone, that is, the geometry of the device of the present invention dictates its focal point, which is used to measure the critical angle in a single step. Third, the present invention permits the immediate assignment of the normal, again in a single step, for the determination of trabecular and cortical bone strength. None of the newly cited art is able to distinguish between trabecular and cortical bone, in a concurrently, reliable manner. Applicants, therefore, submit that the newly cited art does not anticipate or render obvious the present invention.

Conclusion


It is believed that all matters set forth in the Office action have been addressed. Applicants respectfully request reconsideration and allowance of claims 36-62 and 87 and 88.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

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Respectfully submitted,

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